

## Robotic Vehicle Proxy Simulation

**Energid Technologies****Technical Abstract**

Energid Technologies proposes the development of a digital simulation to replace robotic vehicles in field studies. It will model the dynamics, terrain interaction, sensors, control, communications, and interfaces of a robotic vehicle with the goal of supporting validation and training. The simulation will be very easy to use by simple execution on a networked PC. It will connect to NASA's robot-control frameworks and be easy to configure using a drag-and-drop interface. It will be thorough in its ability to model a range of environments, from terrestrial to lunar, and through its ability to provide accurate sensor and truth data for analysis. It will include simulation of communication latency and bandwidth restrictions. Sensors will be modeled through a powerful plugin interface that supports tying stimulation of new sensor modalities to terrain and objects. The effort will include the development of robot, sensor, and environment models tailored to the simulation of field-study vehicles, and it will emphasize mimicking the network interfaces used by NASA. The proxy simulation will be able to model multiple and disparate robots simultaneously. Energid will implement and deliver a complete, executable system and an underlying C++ software toolkit.

**Company Contact**

James English  
(617) 401-7090  
jde@energid.com

## Fusion of Built in Test (BIT) Technologies with Embeddable Fault Tolerant Techniques for Power System and Drives in Space Exploration

**Impact Technologies, LLC****Technical Abstract**

Impact Technologies has proposed development of an effective prognostic and fault accommodation system for critical DC power systems including PV systems. Overall goal for this program is development of techniques that enable power system fault tolerance based on diagnostic features from the solar cells, power bus, and power transistors. After completion of Phase I efforts towards this goal, Impact has achieved substantial and promising results in several technical areas that provide opportunities for maturing PHM tools. The technical areas covered include: 1) solar cell modeling and characterization, 2) power system monitoring, 3) semiconductor device modeling and aging characterization, and 4) application of the leakage current sensing to DC systems. During Phase II, impact will apply and maturing phase I accomplishments to incorporate and embed effective PHM techniques and fault tolerance for power system reliability and extended operation. Impact also plans development of a prototype low cost dynamic leakage current sensor for solar cell and DC power system application. The long-term implications of a successful completion of this program will provide reliability and health management tools for the state-of-the-art technologies, such as advanced power systems based on solar power generation, contributing directly to NASA's ISHM efforts.

**Company Contact**

Antonio Ginart  
(404) 526-6188  
antonio.ginart@impact-tek.com